

What is claimed is:

1. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:  
providing a processing solution consisting of an aqueous solution which includes hydricid fluoride salt;  
and

cleaning a surface of a silicon wafer, in a sheet-by-sheet manner, with said processing solution.

2. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said processing solution further includes hydrogen peroxide.

3. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein the hydricid fluoride salt included in said processing solution is ammonium fluoride.

4. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein the hydricid fluoride salt included in said processing solution is tetraalkyl ammonium fluoride.

5. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said processing solution includes HF and  $\text{HF}_2^-$  as etching seeds of silicon oxide.

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6. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein a temperature of said processing solution is one of an ordinary temperature and a temperature nearly equal thereto.

7. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said processing solution further includes a surfactant.

8. A method of manufacturing a semiconductor integrated circuit device according to claim 1, further comprising a step of cleaning the surface of said silicon wafer during ultrasonic vibration of said processing solution.

9. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:

(a) applying a processing solution consisting of an aqueous solution which includes hydrochloric acid fluoride salt thereby to clean a surface of a silicon wafer, in a sheet-by-sheet manner;

(b) subjecting said silicon wafer to a heat treatment thereby to form a gate oxide film on the surface of the silicon wafer; and

(c) patterning a conductive film deposited above said gate oxide film thereby to form a gate electrode.

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10. A method of manufacturing a semiconductor integrated circuit device according to claim 9, wherein said processing solution further includes hydrogen peroxide.

11. A method of manufacturing a semiconductor integrated circuit device according to claim 9, wherein the hydracid fluoride salt included in said processing solution is ammonium fluoride.

12. A method of manufacturing a semiconductor integrated circuit device according to claim 9, wherein the hydracid fluoride salt included in said processing solution is tetraalkyl ammonium fluoride.

13. A method of manufacturing a semiconductor integrated circuit device according to claim 9, further comprising a step of performing the heat treatment of said step (b) without exposing said silicon wafer to the atmosphere, after the applying of said step (a) to clean the surface of the silicon wafer.

14. A method of manufacturing a semiconductor integrated circuit device according to claim 9, further comprising a step of applying a second processing solution containing hydrofluoric acid thereby to clean the surface of the silicon wafer on which said gate electrode is formed.

15. A method of manufacturing a semiconductor integrated circuit device according to claim 9, wherein a temperature of said processing solution is one of an ordinary temperature and a temperature nearly equal thereto.

16. A method of manufacturing a semiconductor integrated circuit device according to claim 9, further comprising a step of cleaning said silicon wafer during ultrasonic vibration of said processing solution.

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